

## **V-BLADE IMPELLER DESIGN FOR A REGENERATIVE TURBINE**

(57)

### **ABSTRACT**

A novel impeller for a regenerative turbine fuel pump improves the efficiency of the pump and yet still retains a geometry that allows it to be manufactured by conventional injection molding techniques at a relatively low cost. The impeller comprises a hub, an outer ring and a plurality of innovative V-shaped vanes. The hub defines an aperture into which the shaft of the pump is securable to allow the hub to rotate about a center axis. The outer ring is concentric to the hub. The vanes extend from an outer surface of the hub to an inner surface of the outer ring. Each vane comprises an entrance portion that extends from the outer surface of the hub and an exit portion that extends from the entrance portion to the inner surface of the outer ring. Each vane has a V-shape of a prespecified angle centered relative to a plane normal to the center axis. Each vane is also at least partially non-linear on at least one of an upstream face and downstream face of the vane from the entrance portion thereof through the exit portion thereof. Each outer sidewall of each entrance portion is also chamfered along its trailing corner. The chamfer is made at a predetermined angle relative to the aforementioned plane.